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ABSTRACT

The Consensus Validation Conference on Augmentative and Alternative Communication Intervention brought together researchers, educators, parents, clinicians, and persons who use Augmentative and Alternative Communication (AAC) systems to arrive at consensus on best practices and benefits of AAC. Questions addressed include: definition of AAC and specification of who can benefit from its use; the nature, scope, and essential components of AAC intervention; relationships that should exist among people with significant communication disabilities and their families; professionals and funding sources to achieve effective outcomes; expected consumer and societal outcomes and benefits; relationship of AAC to receptive and expressive communication; and future research and education needs. (JDD)

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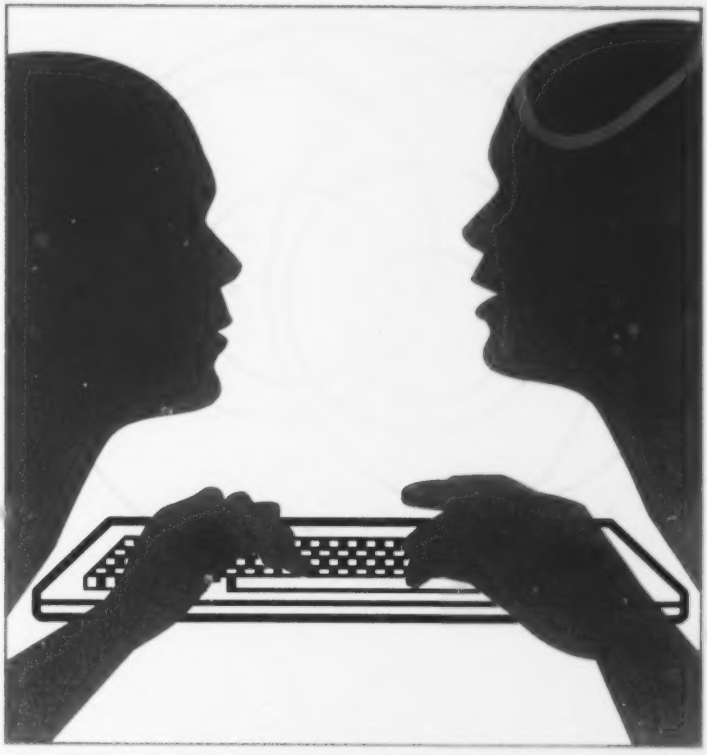

Augmentative and Alternative Communication Intervention

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CONSENSUS STATEMENT

National Institute on Disability and Rehabilitation Research
March 23-26, 1992

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NIDRR Consensus Statements are prepared by a non-federal 10-member panel, based on (1) resource papers prepared by experts; (2) testimony presented by researchers, clinicians, and consumers during a one-and-a-half-day public hearing; and (3) a day of closed deliberations by the panel during which the consensus statements are prepared. This statement is an independent report of the panel and is not a policy statement of NIDRR or the Federal Government.

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Abstract

The Augmentative and Alternative Communication Intervention Consensus Validation Conference brought together researchers, educators, parents, clinicians, and persons who use Augmentative and Alternative Communication (AAC) systems to arrive at consensus on best practices and benefits of AAC. Questions addressed included the nature, scope, and essential components of AAC intervention; relationships that should exist among people with significant communication disabilities and their families; professionals and funding sources to achieve effective outcomes; expected consumer and societal outcomes and benefits; relationship of AAC to receptive and expressive communication; and future research and education needs. AAC refers to all forms of communication that enhance or supplement speech and writing. AAC intervention fosters functional spoken and written communication across all of an individual's environments and throughout life. People at any age whose gestures, speech, or written communication are temporarily or permanently inadequate to meet all of their communication needs can benefit from AAC, as can those who interact with AAC users.

AAC benefits people with significant communication disabilities through improved relationships, improved health and safety, greater self determination and control, participation in education, family life, and the community, increased employment opportunities, and independence. Society benefits when people with significant communication disabilities have access to AAC because they are more likely to be financially independent and community attitudes become more positive.

All people needing AAC interventions should receive them as early as possible regardless of severity of the communication disability or sensory, motor, or cognitive levels of functioning. A team approach is considered most effective. Essential components include: comprehensive assessment of individual communication, developmental, and educational needs across all environments; setting intervention priorities; appropriate selection, customization, and integration of AAC systems; instruction for AAC users and communication partners; and ongoing evaluation and follow up to support functional use.

Collaborative relationships among consumers, service providers, community researchers, funding sources, and manufacturers can ensure a system of universal access to AAC. To promote good relationships, all parties must have access to complete information about products. Also, information on service delivery, in conjunction with access to professionals, funding services, and support programs, must be available to AAC users.

Although further research is necessary, it is apparent that AAC systems can support comprehension as well as facilitate expression. AAC intervention can increase understanding of spoken language, improve speech production, and enhance literacy. Receptive, expressive, and written communication skills can also facilitate AAC use.

Educational priorities identified included the need for education of consumers, families, and other communication partners as well as education of professionals and researchers. Public awareness of AAC is a major educational priority.

Future research will involve an interplay of knowledge from many fields of study and should focus on topics such as efficacy of AAC interventions; receptive and expressive communication and AAC; impact of AAC on natural speech; literacy; outcomes; demographics; communication partners and interactions; communication competence; technology development; selection, customization, and integration of AAC systems; motor control; and transitions across the life span. Research in AAC must address issues across disability groups, ages, and socio-cultural backgrounds. Researchers are encouraged to seek input from people with significant communication disabilities.

Introduction

Communication is the essence of human life. All people have the basic right to communicate. Furthermore, all people can and do communicate. However, approximately 2 million Americans with significant communication disabilities are unable to do so effectively. Many lack access to vital supports and services and remain "voiceless" in today's society. Having an effective communication system affords greater independence and allows people to participate more fully in daily home, school, leisure, work and community activities.[1]

In order to realize their fundamental right to communicate, people with significant communication disabilities must have access to augmentative and alternative communication (AAC). Laws and rules exist for the provision of AAC services. However, the letter and spirit of these mandates must be implemented consistently so that all people can communicate and live life to the fullest extent possible. A woman with significant physical and communication disabilities who spent most of her life locked away in the back ward of an institution points out, **"When you can't talk and people believe your mind is as handicapped as your body, it's awfully difficult to change their opinion"** (Sienkiewicz-Mercer, R. and Kaplan, S. B. (1989). *I Raise my Eyes to Say Yes*. Boston: Houghton Mifflin). In dismissing the communicative intent of someone, one dismisses the person behind that intent

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[1] National Joint Committee for the Communicative Needs of Persons With Severe Disabilities (1992), *Guidelines for Meeting the Communication Needs of Persons With Severe Disabilities*, Asha, 34 (March, Supp. 7), 1-8; United Cerebral Palsy Association, *Policy on Communication Access and Free Speech Rights of Americans with Disabilities* (1992); American Speech-Language-Hearing Association (1991), *Augmentative and Alternative Communication*, Asha, 33 (Supp. 5), 8. This consensus is further supported by the laws and rules establishing rights and providing benefits to persons with disabilities. The Federal laws and benefits programs that include or cover AAC interventions or promote or protect access to AAC interventions include: Individuals With Disabilities Education Act, 20 USC Sect. 1400 et. seq.; Education for All Handicapped Children Act Amendments, P.L. 99-457, adding 20 USC Sect. 1471-1485; Rehabilitation Act of 1973, 29 USC Sect. 701 et. seq.; Maternal and Child Health Services Block Grants (Social Security Act, Title V), 42 USC Sect 701; Medicaid Act, 42 USC 1396. et. seq; and Americans With Disabilities Act, P.L. 101-226.

The history of AAC is relatively brief. It represents the use of multiple technologies and approaches—communication boards, sign language and gesture systems, and, most recently, computers. The primary goal of AAC is to enable individuals who cannot use natural speech or writing to communicate effectively and participate fully in society.

Consensus Validation

The Consensus Validation Conference on Augmentative and Alternative Communication Intervention brought together the various types of expertise held by researchers, clinicians, educators, and people with disabilities and their families in an effort to arrive at consensus on the best practices known today in AAC. The consensus panel heard testimony for a day and a half and then deliberated to synthesize the testimony with information contained in prepared research summaries in order to formulate a response to the following six questions:

1. What is augmentative and alternative communication and who can benefit from its use?

2. What are the nature and the scope of augmentative and alternative communication intervention? What are the essential components?

3. What relationships should exist among consumers, "family," service providers, community, manufacturers, researchers, and funding sources to achieve effective outcomes?

4. What are the effective consumer and societal outcomes and benefits that can be expected from augmentative and alternative intervention?

5. What is the relationship of augmentative and alternative communication to expressive and receptive communication processes?

6. What are the research and education issues that need to be addressed?

What is Augmentative and Alternative Communication and Who Can Benefit From Its Use?

Augmentative and alternative communication (AAC) refers to all forms of communication that enhance or supplement speech and writing. It is an internationally recognized area of clinical and educational practice that attempts to compensate, temporarily or permanently, for significant speech, language, and writing disabilities. The words "augmentative" and "alternative" have been merged purposefully to capture the idea that this method of communication can both enhance (augmentative) and replace (alternative) conventional forms of expression.

AAC includes conventional and nonconventional ways to convey thoughts and ideas, needs, and information. Some forms of AAC are commonly used by the general public and include gestures, facial expressions, eye pointing, head nodding, writing, drawing, as well as communication aids such as telephones, computers, typewriters, and tape recorders.

Some forms of AAC, on the other hand, have been developed specifically for people with significant communication disabilities. AAC includes aided and unaided techniques. Aided techniques include the use of electronic and non-electronic devices to supplement or replace speech—such as communication boards with words, phrases, and pictures or computer-based communication systems. Sign language, gestures, and finger spelling are examples of unaided forms of communication.

People at any age whose gestures, speech, or written communication are temporarily or permanently inadequate to meet all of their communication needs can benefit from AAC. A number of different conditions may underlie the need for AAC—cognitive, neurological, structural, emotional, or sensory. These include conditions that are present at birth (congenital) or are acquired at any time during a person's life. Some common examples of congenital conditions resulting in a possible need for AAC include cerebral palsy, mental retardation, autism, deaf/blindness and developmental apraxia of speech. Acquired disabilities that may require increasing reliance on AAC include traumatic brain injury, stroke, spinal cord injury, repetitive stress syndrome and laryngectomy. For a number of reasons, such as surgery, injuries, or burns, people may become

temporarily unable to communicate effectively and can also benefit from AAC.

The benefits of AAC for people unable to speak or write are without limit. The ability to communicate effectively greatly improves overall quality of life by increasing access to adequate health care, independence, personal control, and educational, social, and employment opportunities.

People who use AAC are not the only ones who can benefit. Less obvious are the benefits to those who interact with AAC users and to society in general. Communication is defined as the exchange of thoughts and messages. Through AAC, families and friends come to know the thoughts and feelings of loved ones. Health-care workers have greater opportunities to learn first-hand what individuals feel and can then more efficiently meet their needs. Employers have a larger pool of prospective qualified employees. Someone with the capability of expressing needs and wishes, who joins the workforce and pays taxes, becomes a more active, wiser consumer. Also, society has the advantage of ideas and knowledge from an involved, contributing member of the community who is no longer a passive recipient but an active voice able to instruct, encourage, and lead.

We have attempted to address the question, "Who can benefit from AAC?" A better question was posed by Ruth Sienkiewicz-Mercer, author and AAC user, during testimony for this consensus process when she asked, **"Who doesn't benefit?"**

What Are the Nature and the Scope of Augmentative and Alternative Communication Intervention? What are the Essential Components?

AAC intervention fosters conversation, written communication, and telecommunication across all of an individual's environments and throughout life. All people needing AAC interventions should receive them regardless of their communication disability, and sensory, motor or cognitive levels of functioning.

The goal of AAC intervention is to empower persons with significant communication disabilities and their communication partners (e.g., parents, teachers, spouse, friends) with the knowledge and skills

needed to enhance the person's communication in all daily activities. Intervention provides opportunities for greater participation, independence, and self determination in all areas of life.

AAC intervention is most effective when a team approach is used. The team should always include the individual, family member, and professionals from multiple disciplines who have expertise in AAC service delivery. Traditionally, this would involve a speech-language pathologist, educator, and occupational therapist. Other disciplines represented on the team may be audiology, computer technology, medicine, physical therapy, psychology, rehabilitation engineering, social work, and vocational rehabilitation. Composition of the team varies with the needs, age, and disability of the individual. The person with a disability and family member are crucial members of the team and should be involved in needs assessment, goal identification, system selection, program development, and evaluation to ensure that interventions address the needs of the person with the communication disability and result in enhanced communication and participation in society.

The following are essential components of AAC intervention:

1. Assessment of communication needs (face to face, written, and telecommunication) across all environments;

2. Setting priorities for AAC intervention;

3. Assessment of the individual's cognitive and educational performance; motor skills; seating and positioning; sensory and perceptual skills; socio-emotional development; and speech, language, and literacy skills;

4. Selection, procurement, customization, integration, and maintenance of appropriate AAC systems and related technologies across all environments;

5. Instruction and skill development for the AAC user;

6. Instruction of communication partners;

7. Ongoing evaluation of the intervention program to ensure effectiveness and satisfaction; and

8. Follow-up supports and re-assessment as required.

AAC interventions are driven by the individual's needs. Present and future needs are considered in formulating short and long term intervention planning.

AAC interventions are two pronged, involving intervention with people who use AAC to ensure that they have the tools and the skills to communicate effectively with others; and intervention with communication partners to ensure that there are opportunities to communicate.

The realization of effective communication by people with severe communication disabilities depends on the selection and customization of appropriate AAC systems and the development of appropriate skills. AAC systems serve as tools for communication. The individual requires multiple means of communication—such as gestures, eye pointing, natural speech, portable computer-based voice output communication aids, communication boards, computer systems for written communication—in order to meet a wide range of communication needs. Suitable components are selected on an individual basis following a clear delineation of system requirements derived from the assessment of the individual's needs and skills. This requires knowledge of all appropriate options available. AAC should be as effective and efficient as possible. Natural speech should be fostered whenever possible.

However, simply providing AAC systems as tools for communication is not sufficient to assure effective communication. Intervention must also focus on development of the skills necessary to support the functional use of these systems to communicate effectively in face-to-face interactions, in written communication, and via telecommunication. The skills required to support effective communication are complex and include language, literacy, social, motor, strategic, and system-operation skills.

Just as daily communication poses a challenge for those who use AAC, so too can it pose a challenge for communication partners. Communication partners find themselves in atypical roles when

interacting with people who use AAC. They are sometimes called upon to teach others how to interact and communicate with the person who uses AAC. Intervention may be required for others to develop the knowledge and skills required to support daily interactions with significant others who use AAC systems. Communication partners may require instruction in the operation and maintenance of the AAC systems and in strategies to facilitate communication and integrate AAC into daily life. As AAC users develop more effective communication, they are encouraged to assume responsibility for guiding their communication partners.

Given the challenges facing people with disabilities in achieving effective communication, AAC intervention is time and labor intensive. Intervention should occur as early as possible. Early intervention with infants and young children allows the team to plan for the future and to maximize communication and social competence. Early awareness of the AAC option is also encouraged for people who are losing speech function as a result of a progressive neurological condition. Timely intervention will help avoid the risks and frustrations associated with reduced access to communication and social participation.

Intervention is a dynamic process. Evaluation occurs on a regular basis to assure effectiveness and satisfaction with intervention. Goals are revised as skills develop and as needs change. When needs and skills change, modifications to the person's AAC systems may be required.

What Relationships Should Exist Among Consumers, Family, Service Providers, Community, Manufacturers, Researchers, and Funding Sources to Achieve Effective Outcomes?

To realize the potential of augmentative and alternative communication, goals to establish a continuum of services should exist among people with significant communication disabilities, service providers, community, researchers, funding sources, and manufacturers.[5]

At present, there are pervasive barriers that impede the development of good collaborative relationships among these groups. These

barriers include: the absence of professionals with AAC competence within the community; the lack of expertise and knowledge about AAC; the lack of information exchange; the lack of cooperation or coordination; competing demands (e.g., large case loads and the provision of labor intensive AAC services); and the lack of uniform funding criteria. The result is inconsistent access to AAC for persons with disabilities.

To overcome these barriers and to ensure a system of universal access to AAC, individuals with disabilities, family members, researchers, and service providers should have:

- Product information, including product features, function, reliability, range of performance, user friendliness, warranties, service, and maintenance from manufacturers in order to make informed choices;
- Information about service delivery, including evaluation, funding, training, and follow-up;
- Access to professionals with AAC expertise for instruction, evaluation, and follow-up;
- Access to funding assistance, if needed; and
- Access to support programs and mechanisms that will advocate for awareness and consumer choice.

Service delivery programs should:

- Provide people with significant communication disabilities with increased opportunities to participate in the selection and utilization of devices;
- Develop service delivery mechanisms that offer outreach and local on-site service;
- Develop instructional programs to increase staff awareness and technical expertise;

- Develop awareness programs for industry and employers, involving people with communication disabilities;

- Develop feedback mechanisms to learn from people with significant communication disabilities how well AAC meets current and long-term needs; and

- Participate with State-based Assistive Technology Programs to remove funding and information barriers.

The community should:

- Identify and eliminate barriers that interfere with communication; and

- Create and maintain an environment in which people who use AAC can participate fully.

Research and training programs should:

- Conduct research to establish a solid scientific base in AAC to guide clinical and educational practice;

- Conduct research and development to promote improved AAC;

- Develop pre-service curricula in AAC for professionals from multiple disciplines; and

- Develop internships in clinical programs, business, and industry.

Funding programs should:

- Provide consistent, predictable decisions based on uniform criteria regarding the coverage of AAC systems and services;

- Issue decisions that are consistent with the text and the intent of the laws and rules providing access to AAC;
- Authorize coverage of AAC systems and services at the lowest level of the administrative process and in a timely manner;
- Coordinate their decision making to equitably distribute costs for people eligible for multiple funding programs;
- Develop plans by which consumers can meet the cost of maintaining and replacing technology;
- Develop and enforce policy statements that resolve practical day to day issues of AAC use; and
- Monitor and enforce existing duties to provide AAC; and continually review practices to identify and remove AAC access and service barriers.

Manufacturers should:

- Disseminate product information to individuals with disabilities and service providers;
- Evaluate product effectiveness with consumer input from persons with significant communication disabilities;
- Provide warranties and timely product maintenance and servicing;
- Ensure compatibility with other technologies;
- Provide AAC systems for trial use;
- Work with researchers to facilitate technology transfer to the marketplace; and
- Exhibit products and participate in seminars and conferences.

What Are the Effective Consumer and Societal Outcomes and Benefits That Can Be Expected From Augmentative and Alternative Intervention?

AAC benefits people with significant communication disabilities by improving the quality of their lives in the following ways:

Improved Relationships. Without an effective means of communication, people are often isolated, lonely, and misunderstood. Without AAC, a person is unable to make the most rudimentary human contacts such as greeting someone, asking for directions, or answering a phone. Effective use of AAC enables people to share feelings, thoughts, and humor with others. Testimony from a father and husband who uses AAC underscores this point: "Being able to tell anyone what you think, why you think what you do, and what you expect them to do about what you think has improved my relationships with others."

Improved health and safety. AAC can greatly improve a person's health, safety, and medical care by enabling communication with medical personnel, reducing depression, preventing choking, and allowing participation in the management of rehabilitation programs. In acute or chronic illness, AAC use may be the only means for people to express their wishes regarding the course of their treatment.

Greater self determination and control. AAC enables people with significant communication disabilities to have greater control over their lives. AAC enables people to "speak for themselves." AAC also enables a person to develop a social and political voice. Even as we celebrate the bicentennial of the ratification of the Bill of Rights and its First Amendment guarantee to free speech, access to AAC is still not a national priority. One 38-year-old man who uses AAC states:

> "I have lived for the past thirty years in a nursing home. It has been awful. All of my choices have been taken from me. I have been treated like a helpless baby. I want to choose the people I live with and make my own decisions in directing my life. With my communication device I have a new sense of power."

Participation in Education. Teaching and learning are to a large extent acts of communication. Effective use of AAC improves access to educational opportunities and may reduce the troubling statistic that only 4 of 10 students with disabilities graduate from high school with a diploma. AAC increases integrated educational opportunities, especially access to higher education. Likewise, AAC increases opportunities for literacy learning—and literacy is an imperative for functioning in the mainstream of education and society.

Participation in Family Life. When a family member has access to effective AAC supports, life is easier for all. Effective AAC use lessens family tensions. Research has demonstrated that aggressive and self-injurious behaviors are dramatically reduced when AAC systems are introduced. Additionally, use of AAC by children and adults with significant communication disabilities can promote functional self-help skills.

Participation in the Community. Participating in and contributing more to the community are important benefits of AAC. AAC has been used successfully to enhance the abilities and participation of people with significant communication disabilities in recreational programs, and in the general life of a community. For example, several adults who use AAC are contributing to local, state, and national advisory boards. With AAC, people with significant communication disabilities are not solely consumers of services but, rather, they are contributing members of their community.

Increased Employment. Employment is a critical aspect of the lives of most adults in our society. The income generated by work creates purchasing power in the community, makes community integration easier, enhances independence, and creates personal status. Employment offers opportunities to contribute to society, establish an adult identity, and expand social contacts. Yet, unemployment is one of the major problems facing people with significant disabilities, including those with communication disabilities. In the United States, about two-thirds of adults with disabilities are unemployed. The barriers to employment are even more pervasive for persons with severe communication disabilities. AAC removes a major barrier to employment. In addition, knowing how to operate AAC technology may extend to the control of technology in the workplace.

Increased Independence. It is difficult, if not impossible, to live independently without the ability to communicate effectively. Shopping, telephone communication, traveling within the community, eating at restaurants, directing personal assistants, and banking are but a few daily activities that require effective communication. Without it, people with significant communication disabilities are likely to remain in segregated, dependent, and costly living arrangements.

Benefits to Society

Society also benefits when people with significant communication disabilities have access to AAC.

People with severe communication disabilities who effectively use AAC are more likely to be self supporting or partially self supporting. As one 38-year-old AAC user stated, "The cost of an AAC system is not expensive given that I can function as a husband, a father, and a bread winner. I can run a publishing business because I am able to communicate with my customers."

Another potential societal benefit of AAC is a more diverse environment where members of society learn that people who use AAC are "differently able." This message is enriching because all of us face the risk of becoming disabled. Exposure to people who are proficient users of AAC can reduce fears and change attitudes that perpetuate discrimination.

Although AAC services and supports can be expensive, the benefits of AAC far outweigh the costs. With AAC, high costs of unemployment, institutionalization and increased hospitalization can be substantially reduced. Yet, even with the passage of the Americans with Disabilities Act (ADA), people with significant communication disabilities will continue to experience discrimination until they can access needed AAC and are able to communicate effectively.

What is the Relationship of Augmentative and Alternative Communication to Expressive and Receptive Communication Processes?

To communicate effectively, an individual must be able to both express and receive messages. Traditionally, AAC systems have been considered primarily as an output mode for the expression of messages. The role of listener or receiver of messages is important also. To be effective, AAC intervention requires a balanced blend of receptive and expressive experiences.

Relationship of AAC to Receptive Communication

To date, little attention has been directed toward understanding the roles that comprehension of both spoken language and AAC symbols play in the AAC intervention process. The relationship of AAC to spoken language comprehension deserves the immediate attention of researchers and practitioners to better meet the communication needs of persons using AAC.

For individuals who use AAC systems, there are at least two routes to understanding another's message: through the comprehension of spoken language, or through the understanding of AAC symbols:

A. **Comprehension of Spoken Language**

Many people who use AAC systems already comprehend spoken language and rely on AAC systems primarily for expression. Their comprehension of spoken language serves as the foundation for AAC learning. These individuals have established the relationships between spoken words and the concepts they represent during life experience. They are able to use this knowledge as a foundation upon which to build relationships between AAC symbols and the concepts they represent.

However, children who use AAC still may be in the process of developing the skills to comprehend spoken language. Comprehension of spoken language permits children to observe and absorb the communicative process prior to assuming the role of speaker or message

sender. The relevance of comprehension to AAC use is supported by findings from studies of language acquisition. Studies show that children who produce little speech early in the language development process may be processing the speech and language they hear and advancing their linguistic competence. Research suggests that speech and language comprehension of spoken language may be developing even when a child is not talking.

Some children (and others with acquired significant communication disabilities; e.g., people with developmental disabilities, severe forms of aphasia, or acquired brain injuries) may encounter difficulty in processing and comprehending spoken language. They require AAC systems to support comprehension as well as to facilitate expression. Often, such comprehension difficulties continue into adulthood.

B. **Comprehension of AAC Symbols**

Another route to understanding messages is through the comprehension of AAC symbols, both aided and unaided. Individuals who have difficulty comprehending spoken language may require augmentative communication inputs to support their comprehension. Their input includes spoken language from the communication partner supplemented by input from the aided or unaided AAC system. Such input may serve a number of functions in the AAC learning process. First, it provides experiences that illustrate the meanings of AAC symbols and the varied functions they serve, thus supporting comprehension. Second, it models ways in which the AAC system can be used during communicative exchanges. Third, its use by partners makes an implicit statement to the AAC user that the system is an accepted and encouraged form of communication.

Research suggests that artificial speech technology may play a specific role in developing receptive (and expressive) language skills, particularly for individuals who have difficulties processing natural speech.

Relationship of AAC to Expressive Communication

Traditionally, AAC systems have been used for expressive communication to augment or replace natural speech. Improved speech production has been observed following AAC intervention. Changes have been reported for a wide range of congenital and acquired conditions that result in significant speech disabilities.

There have been limited attempts to study the impact of AAC on speech production. Available research and clinical reports suggest that AAC does facilitate speech production. The findings, however, are not unanimous and suggest the need to better understand how AAC impacts speech, the groups of AAC users who respond most favorably, and the mechanisms that account for the changes.

A review of the literature of more than two decades demonstrates a correlation between AAC intervention and improved natural speech performance. Improved natural speech performance may be caused by the AAC intervention itself. Alternative explanations include: maturation, improvement in the structure and function of the speaking mechanism, time post onset of injury, a Hawthorne effect (i.e., change affected by simply paying attention to speech function), an interaction effect between AAC intervention and speech-language treatment, and improved listener performance.

Relationship of AAC to Literacy

Literacy (i.e., reading and writing) is an essential receptive and expressive communication process. Literacy, like all receptive and expressive language learning, is a continuous process that begins at birth. Written language development is concurrent and interrelated with oral language development. The important implication of literacy research for AAC users is that written language learning is not dependent upon speech production or other prerequisite skills. The relationship between literacy and AAC is bi-directional: literacy development facilitates AAC and enhances communication competence; AAC may also facilitate literacy learning.

What Are the Research and Education Issues That Need to be Addressed?

Augmentative and alternative communication is a young field. Since its emergence in the 1970s, the field has made significant advances in research and education. However, as the AAC field has developed, numerous questions have emerged. Concerted research is required to address these questions and to further establish a scientific knowledge base. Ongoing intensive efforts are required to disseminate state-of-the-art information and educate people with significant communication disabilities, families, professionals, and the general public. It is only through continued research and education that the AAC field will continue to advance and individuals with severe communication disabilities will truly realize their communication rights.

The following considerations should be incorporated into an AAC research agenda:

Research Issues

Research questions have been organized into a series of topic areas. (The sequence of the list does not reflect the relative importance of the research topics identified.)

- **Research Methods.** The research requirements in the AAC field are diverse. First, research is required to build a sound knowledge base to define principles of clinical and educational practice. In addition, invention and technical research and development are needed to advance AAC technologies. Applied research is necessary to evaluate the efficacy of AAC interventions. Quantitative approaches including focus groups of consumers and families will contribute valuable insights to the field. Research in AAC must address issues across disability groups, ages, and socio-cultural backgrounds. All AAC research endeavors will involve an interplay of knowledge from many fields of study.

- **Receptive and Expressive Communication and AAC.** There is a need for further investigation of the relationships between AAC and receptive and expressive communication processes, including the effect of augmented input on comprehension.

- **Impact of AAC on Natural Speech.** The impact of AAC on natural speech development and recovery requires considerable exploration. Predictors for gaining or regaining speech should be identified.

- **Literacy.** Given the importance of literacy in today's society, research is required to explore the effects of AAC on literacy learning and the effects of literacy on AAC. In particular, the potential to facilitate literacy learning through technology should be explored.

- **Outcomes.** Appropriate and objective outcome measures should be identified to evaluate AAC intervention. Cost-effectiveness and measures of quality of life should be included in this analysis.

- **Demographics.** A better understanding is required of the incidence of significant communication disabilities. In addition, knowledge of prevalence of specific subgroups of people who require AAC is needed. This information will help determine research, marketing, funding, and clinical service priorities for the future.

- **Communication Partners and AAC.** It is believed that effective communication partners contribute to the success of AAC interventions. Research is needed to delineate the characteristics associated with both successful and unsuccessful communication partners and to identify effective methods of instruction.

- **Communication Competence.** The goal of AAC intervention is to enhance the communication competence of persons with significant communication disabilities. Investigations should be conducted to

identify the factors that contribute to communication competence and to delineate factors that influence social perceptions of competence.

- **Technology Development in AAC.** The availability of technology offers unique and significant opportunities for people with significant communication disabilities. The challenge is to invent technical innovations that maximize function and minimize the demands on the user.

- **Selection, Customization, and Integration of AAC Systems.** The success of AAC interventions rests on the appropriate match of AAC systems to the needs and skills of the individual. Research should investigate the features of AAC systems including symbols, the language content and their relationship to human needs and abilities.

- **Motor Control in AAC** . There is a lack of research data showing how varying motor control affects the ability to operate AAC systems. Evidence is needed to determine patterns of motor control that allow for improved access and contact.

- **Best Practices.** Identification and validation of best practices is needed in order to maximize clinical and educational outcomes. Comparative efficacy of various interventions should be established.

- **Interaction.** It is well established that interactions involving persons who use AAC differ significantly from those of natural speakers. Research is required to extend the understanding of these interaction patterns and to identify intervention approaches to facilitate the communication process.

- **Transitions.** It is known that people with significant communication disabilities have difficulties with transitions from home to school and school to the community and workplace. Studies should explore the supports required to ease transitions across the life span.

- **Policy-relevant Research.** Research is needed that will identify the extent to which federal, state, and local policies foster or impede universal access to AAC. This research should extend to the practices of private insurers.

Education Issues

The following education priorities were identified by the consensus panel (the sequence of the list does not reflect the relative importance of the educational needs identified).

Education needs in AAC are considerable. Needs fall into categories:

Education of Consumers, Families, and Other Communication Partners

- People who use AAC should be empowered to assume as much responsibility as possible for their own communication programs.

- Family members, personal assistants, and peers need instruction in AAC use, the funding process, device maintenance, and customization.

Education of Professionals

- Professional preparation extends to all personnel who provide services to people who use AAC. This training would include preparation at the preservice level as well as continuing education for professionals already employed.

- People who use AAC and their family members ideally should be involved in the design, instruction, and evaluation of the training.

Other priorities for the education of professionals include:

- Coursework in AAC should be required in pre-service training, differentiating what is required by all professionals and what is required by specialists.
- A need exists for increased numbers of professionals trained in AAC.
- Guidelines are needed with regard to the minimum education competencies necessary for service-delivery personnel to effectively deliver AAC services.
- Since literacy is an essential component of AAC intervention, training programs are needed for professionals to develop the knowledge and skills required to incorporate literacy into AAC intervention.
- A need exists for professionals to be trained in the laws and rules that support AAC funding, and about the existence and roles of professional advocates.

Education of Researchers

- Researchers with competencies in a range of methodologies and AAC issues are required.

Public Awareness

- Existing information on AAC, the laws and regulations that support access to AAC, and ways to expand integrated educational opportunities should be made available to a widespread audience. Updated and accessible information about AAC approaches, devices, services, and trained personnel need to be available at local, regional, and national levels (information doubles every 18 months).
- A list of questions for consumers to ask about a service provider's professional background and to ask manufacturers about devices should be prepared.

- Education of public and private insurance providers is necessary regarding the need for, scope, and benefits of AAC.

Early Intervention and Literacy

- It is important to stress that early intervention and early literacy experiences increase the effectiveness of AAC use.

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Authors of Resource Papers

Strategies that Result in Integrating AAC Users into the Community (Education, Work, and Other Aspects of Community Functions)

Michael B. Williams, MLIS

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David Beukelman and Gary D. Cumley

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